

Serial No.: 09/135,183

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**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions and listings of all claims in the application.

**Listing of Claims**

1. **(Previously presented)** A composition comprising:

a) an electrode comprising:

- i) a self assembled monolayer comprising conductive oligomers; and
- ii) a nucleic acid capture probe;

b) a target nucleic acid sequence comprising a first nucleic acid portion that is hybridized to said capture probe, and a second portion that is not hybridized to said capture probe and comprises at least one covalently attached electron transfer moiety (ETM).

2. **(Currently amended)** A composition comprising:

a) an electrode comprising:

- i) a self assembled monolayer comprising conductive oligomers; and
- ii) a nucleic acid capture probe;

b) a label nucleic acid probe comprising a nucleic acid first portion, a second non-nucleic acid portion comprising a recruitment linker that comprises a plurality of ETMs at least one covalently attached electron transfer moiety (ETM).

Claims 3-10: **(Canceled)**

11. **(Currently amended)** A method of detecting a target nucleic acid sequence in a test sample comprising:

a) forming a hybridization complex including said target sequence and a capture probe; wherein said capture probe is on an electrode comprising a self assembled monolayer comprising conductive oligomers;

b) directly or indirectly attaching at least one label probe to said target sequence to form an assay complex, wherein said label probe comprises a first portion capable of

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hybridizing to a component of said assay complex, and a second portion comprising a recruitment linker that:

- i) does not hybridize to a component of said assay complex; and
- ii) comprises a plurality of ETMs at least one covalently attached electron transfer moiety (ETM<sub>s</sub>); and
- c) detecting the presence of said ETMs using said electrode.

**Claims 12-13: (Canceled)**

14. **(Original)** A method according to claim 11 wherein said target sequence is attached to said electrode by hybridizing a first portion of said target sequence to a first capture extender probe, and hybridizing a second portion of said first capture extender probe to a capture probe on the electrode.

**Claims 15-22: (Canceled)**

23. **(Currently amended)** A composition comprising:

- a) an electrode comprising:
  - i) a self assembled monolayer; and
  - ii) a nucleic acid capture probe;
- b) a target nucleic acid sequence comprising a first nucleic acid portion that is hybridized to said capture probe, and a second portion that is not hybridized to said capture probe and comprises at least one covalently attached ETM electron transfer moiety (ETM).

24. **(Currently amended)** A composition comprising:

- a) an electrode comprising:
  - i) a self assembled monolayer; and
  - ii) a nucleic acid capture probe;
- b) a label nucleic acid probe comprising a first nucleic acid portion, and a second non-nucleic acid portion comprising a recruitment linker that comprises a plurality of ETMs at least one covalently attached electron transfer moiety (ETM).

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25. **(Currently amended)** A method of detecting a target nucleic acid sequence in a test sample comprising:

- a) forming a hybridization complex including said target sequence and a capture probe; wherein said capture probe is on an electrode comprising a self-assembled monolayer;
- b) directly or indirectly attaching at least one label probe to said target sequence to form an assay complex, wherein said label probe comprises a first portion capable of hybridizing to a component of said assay complex, and a second portion comprising a recruitment linker that:
  - i) does not hybridize to a component of said assay complex; and
  - ii) comprises a plurality of ETMs at least one covalently attached electron transfer moiety (ETM<sub>s</sub>); and
- c) detecting the presence of said ETMs using said electrode.

26. **(Currently amended)** A composition comprising:

- a) an electrode comprising:
  - i) a self assembled monolayer comprising conductive oligomers; and
  - ii) a nucleic acid capture probe;
- b) a label nucleic acid probe comprising a first portion and a second portion wherein said second portion comprises a recruitment linker comprising a plurality of ETMs a-target nucleic acid; and
- c) a target sequence comprising a first portion hybridized to said capture probe and a second portion hybridized to said first portion of said label probe, wherein said second portion of said label probe does not hybridize to said target sequence a-label-nucleic-acid probe comprising a first nucleic-acid portion that is hybridized to said target nucleic acid, and a second nucleic-acid portion comprising a recruitment linker that comprises at least one covalently attached electron transfer moiety (ETM).

27. **(Currently amended)** A composition comprising:

- a) an electrode comprising:

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- i) a self assembled monolayer; and
  - ii) a nucleic acid capture probe;
- b) a label nucleic acid probe comprising a first portion and a second portion wherein said second portion comprises a recruitment linker comprising a plurality of ETMs a target nucleic acid; and
- c) a target sequence comprising a first portion hybridized to said capture probe and a second portion hybridized to said first portion of said label probe, wherein said second portion of said label probe does not hybridize to said target sequence a label nucleic acid probe comprising a first nucleic acid portion that is hybridized to said target nucleic acid, and a second nucleic acid portion comprising a recruitment linker that comprises at least one covalently attached electron transfer moiety (ETM).

28. (Previously presented) A composition according to claims 1, 2, 23, 24, 26, or 27 wherein said ETM is ferrocene.

29. (Currently amended) A composition according to claim [[1]], 2, [[23]], 24, 26, or 27 wherein said label nucleic acid probe comprises a plurality of ETMs.

30. (Currently amended) A composition according to claim [[1]], 2,[[23]], 24, 26, or 27 wherein said first portion of said label probe further comprises a covalently attached ETM.

31. (Currently amended) A composition according to claim 1, 2, 23, 24, 26, or 27 wherein said assay complex composition further comprises an amplifier probe.

32. (Currently amended) A composition according to claim 1, 2, 23, 24, 26, or 27 wherein said assay complex composition further comprises a capture extender probe.

33. (Previously presented) A composition according to claim 1, 2, 23, 24, 26, or 27 wherein said monolayer further comprises insulators.

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34. **(Previously presented)** A composition according to claim 1, 2, 23, 24, 26, or 27 wherein said capture probe is attached to said electrode via a conductive oligomer.

35. **(Previously presented)** A composition according to claim 1, 2, 23, 24, 26, or 27 wherein said capture probe is attached to said electrode via an insulator.

36. **(Previously presented)** A method according to claim 11 or 25 wherein said label probe comprises a plurality of ETMs.

37. **(Currently amended)** A method according to claim 11 or 25 wherein said target sequence is attached to said electrode by hybridization to [[a]] said capture probe.

38. **(Currently amended)** A method according to claim 11 or 25 wherein said target sequence is attached to said electrode by

- a) hybridizing a first portion of said target sequence to a first portion of a first capture extender probe;
- b) hybridizing a second portion of said first capture extender probe to a first portion of [[an]] said capture probe on the electrode;
- c) hybridizing a second portion of said target sequence to a first portion of a second capture extender probe; and
- d) hybridizing a second portion of said second capture extender probe to a second portion of said capture probe.

39. **(Previously presented)** A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by hybridizing said first portion of said label probe to a first portion of said target sequence.

40. **(Previously presented)** A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by

- a) hybridizing a first portion of an amplifier probe to a first portion of said target sequence; and

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b) hybridizing at least one amplification sequence of said amplifier probe to said first portion of at least one label probe.

41. (Previously presented) A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by

a) hybridizing a first portion of a first label extender probe to a first portion of a target sequence;

b) hybridizing a second portion of said first label extender probe to a first portion of an amplifier probe;

c) hybridizing at least one amplification sequence of said amplifier probe to said first portion of at least one label probe.

42. (Previously presented) A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by

a) hybridizing a first portion of a first label extender probe to a first portion of a target sequence;

b) hybridizing a second portion of said first label extender probe to a first portion of an amplifier probe;

c) hybridizing a first portion of a second label extender probe to a second portion of a target sequence;

d) hybridizing a second portion of said second label extender probe to a first portion of an amplifier probe;

e) hybridizing at least one amplification sequence of said amplifier probe to said first portion of at least one label probe.

43. (Previously presented) A composition according to claims 2 or 24 wherein said second non-nucleic acid portion is a metallocene polymer.

44. (Previously presented) A composition according to claim 43 wherein said metallocene polymer is a ferrocene polymer.